

REMARKS

Claims 1-12 and 14-24 are pending in the present application. By this reply, claims 13 and 25 have been canceled. Claims 1, 8, and 17 are independent claims.

35 USC §103(a) Rejection

Claims 1, 8, and 17 have been rejected under 35 USC §103(a) as being unpatentable over Applicants' disclosed related art¹ in view of Kaneko et al. and Ahn et al. This rejection, insofar as it pertains to the presently pending claims, is respectively traversed.

First, without acquiescing to any of the Examiner's allegations made in rejecting these claims, Applicants hereby state that Ahn et al. and the presently claimed invention were, at the time the invention was made, owned by the same Assignee, LG. Philips LCD Co., Ltd. The Assignment for Ahn et al. has been properly recorded at the U.S. Patent and Trademark Office. The Assignment for the present application has also been properly recorded at the U.S. Patent and Trademark Office on December 28, 2001, Reel no. 012419, Frame nos. 0440-0443. Thus, according to 35

¹ It is uncertain whether Applicants' disclosed related art qualifies as prior art under 35 U.S.C. §102 and thus §103. Nevertheless, Applicants will address the rejection(s) assuming that it is for the sake of the argument.

USC §103(c), Ahn et al. cannot be used to reject the present claims.

As a result, Applicants will now address the rejection in combination of only Applicants' disclosed related art and Kaneko et al.

Regarding independent claim 1, the Examiner correctly acknowledges that Applicants' disclosed related art does not disclose the pixel electrode made of an amorphous transparent conductive film. To overcome this deficiency, the Examiner further relies on Kaneko et al. at column 5, lines 47-51.

The Examiner points out that even though Kaneko et al. discloses that the amorphous ITO is used in case of a layered structure for the drain lines, Kaneko et al. discloses the function of the amorphous ITO and the property of the amorphous ITO, and indicates that "the amorphous ITO or IZO is preferably used as the material of the pixel electrodes so that the aluminum alloy is prevented from being damaged during etching of the pixel electrode", see page 3 of the final Office Action. The Examiner also points out that Kaneko et al. indicates that the drain lines may be composed of a single layer. The Examiner alleges that one skilled in the art would be able to use the advantage of the property of the amorphous ITO or IZO to form the pixel electrode

for preventing the contact failure with a drain electrode and for protecting the drain electrode during etching of the pixel electrode.

However, at a closer look, Kaneko et al. teaches the use of the amorphous ITO/IZO as a pixel electrode *only* when a layered structure having an aluminum alloy layer is used as a drain line. On column 5, lines 46-51, Kaneko et al. clearly teaches that the amorphous ITO may be used as a material of the pixel electrode *when* a multiple layered structure is used for the drain lines. This multiple layered structure includes an aluminum alloy layer and a molybdenum alloy layer. For example, Kaneko et al. discloses on column 9, lines 61-64 that the drain line 3A/drain electrode 3B is formed of a layered structure composed of the aluminum alloy layer 8 and the molybdenum alloy layers 7 and 9 as shown in Figure 1. In this case, Kaneko et al. discloses the use of amorphous ITO or IZO because this prevents the aluminum alloy layer 8 from being damaged during the etching of the pixel electrode. In other words, when the drain line is not formed of the multiple layered structure having the aluminum alloy layer, then the use of the amorphous ITO as the pixel electrode material is not needed or disclosed.

Kaneko et al. recognizes and provides as an alternative that the drain line can be composed of a single layer (single molybdenum

alloy layer) without the aluminum alloy layer. In that case, since there is no aluminum alloy layer, Kaneko et al. discloses using the polycrystalline indium tin oxide as the pixel electrode (see column 5, lines 59-65).

Thus, when the drain electrode has a single-layer structure, there is no motivation to modify Applicants' disclosed related art in view of the teachings of Kaneko et al. as suggested by the Examiner. Accordingly, the references are not combinable and do not render obvious, *inter alia*:

a pixel electrode made of an amorphous transparent conductive film . . . and connected to the drain electrode through the contact hole, the drain electrode having a single-layer structure

as recited in independent claim 1.

Independent claims 8 and 17 have been amended to incorporate therein their dependent claims 13 and 25, respectively.

Regarding independent claim 8, Kaneko et al. does not disclose forming an amorphous ITO on a metal film functioning as a pad for the LCD device. Claim 8 as amended requires that the metal film is formed of a same material as a gate line or data line. Since Kaneko et al. nowhere suggests using the amorphous ITO formed on a metal film functioning as a pad for the LCD device and since Kaneko et al.'s use of the amorphous ITO is limited to where an aluminum

alloy layer is used, there is no motivation to modify Applicants' disclosed related art in view of the teachings of Kaneko et al. as suggested by the Examiner. Thus, the references are not combinable and do not render obvious, *inter alia*:

 a metal film formed on the substrate and functioning as a pad for the LCD device;
 an amorphous transparent conductive film . . .
 formed on the metal film,
 wherein the metal film is formed of a same material as a gate line or a data line

as recited in independent claim 8.

Similar to independent claim 1 and/or 8, the references do not render obvious, *inter alia*:

 forming, in each pixel region, amorphous transparent conductive films . . . connected to the drain electrode, the gate pad and the data pad through the contact holes,
 wherein at least one of the drain electrode, the gate pad and the data pad has a single-layer structure

as recited in independent claim 17.

In the alternative, Applicants' embodied invention is directed to having the pixel electrode and/or the pad contact film made of an amorphous conductive film for preventing a generation of a galvanic effect in which a stripper diffuses and penetrates a grain boundary of the poly crystal ITO during a removal of the photo-resist, and thereby causes a contact failure in the pad and TFT

regions. Kaneko et al. fails to teach the use of an amorphous conductive film for preventing a generation of a galvanic effect, as recited in claims 1, 8 and 17.

Accordingly, independent claims 1, 8, and 17 are patentable over the applied references, and reconsideration and withdrawal of the rejection based on these reasons is respectfully requested.

Claims 2-5, 9-12 and 18-22 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' disclosed related art and Kaneko et al. as applied to claims 1, 8 and 17 above, and further in view of Tran et al. (U.S. Patent No. 5,135,581). Claims 6-7, 13-16 and 23-25 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the Applicants' disclosed related art and Kaneko et al. as applied to claims 1, 8, and 17 above, and further in view of Maeda et al. (U.S. Patent Application Publication No. US 2001/0029054). These rejections, insofar as they pertain to the presently pending claims, are respectfully traversed.

As discussed above, Applicants' related art and Kaneko et al. do not render obvious at least the above-noted features recited in independent claims 1, 8, and 17. Further, neither Tran et al. nor Maeda et al. overcomes these deficiencies because none of these references teach or suggest these missing features of claims 1, 8 and 17. Tran is merely relied on for teaching a process of forming

a light transmissive electrically conductive composition at a certain temperature. Maeda et al. is merely relied on for teaching a particular thickness of a conductive thin film.

Thus, independent claims 1, 8 and 17 and their dependent claims (due to their dependency) are patentable over the applied references, and reconsideration and withdrawal of the rejection based on these reasons is respectfully requested.

Conclusion

For the foregoing reasons and in view of the above clarifying amendments, Applicants respectfully request the Examiner to reconsider and withdraw all of the objections and rejections of record, and earnestly solicit an early issuance of a Notice of Allowance.

The Examiner is respectfully requested to enter this Reply After Final, in that it raises no new issues but merely places the claims in a form more clearly patentable over the references of record. In the alternative, the Examiner is respectfully requested to enter this Reply After Final in that it reduces the issues for appeal.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Esther H. Chong (Reg. No. 40,953), to conduct an interview

in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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